

Yacovone, Krista

From: Gorin, Jonathan
Sent: Tuesday, August 20, 2013 4:41 PM
To: Carrie McGowan
Cc: jmhoffman@ashland.com
Subject: RE: Lcp proposed plan
Attachments: LCPpropplan Final.docx; LCP draft Figure 2.pdf; LCP draft Figure 1.PDF

John, Carrie. Here's the proposed plan. I believe Natalie will fix some of the spacing issues in the text, and we'll probably clean up the figures before the meeting (for example Fig 1 labels GAF as LPH). But this is what will go in the Admin Record - now I know how Scott felt.

I got the last round of comments from DEP at 2:30 today, so it was a bit of a rush at the end.

Jon

Ps, this isn't official until tomorrow, so please keep it in house until then.

-----Original Message-----

From: Carrie McGowan [mailto:Carrie.McGowan@ehs-support.com]
Sent: Tuesday, August 20, 2013 1:44 PM
To: Gorin, Jonathan
Cc: jmhoffman@ashland.com
Subject: Re: Lcp proposed plan

Thanks Jon!

Sent from my iPhone

On Aug 20, 2013, at 1:37 PM, "Gorin, Jonathan" <Gorin.Jonathan@epa.gov> wrote:

> Absolutely, we're putting the final touches on it (i.e., addressing some last minute comments from HQ and DEP). Should be done today or the am.

>

> In case you haven't guessed, it's Alt 4b, with Alt 4a and Alt 3 as the contingencies.

>

> jon

>

> -----Original Message-----

> From: Carrie McGowan [mailto:Carrie.McGowan@ehs-support.com]

> Sent: Tuesday, August 20, 2013 1:35 PM

> To: Gorin, Jonathan

> Cc: jmhoffman@ashland.com

> Subject: Lcp proposed plan

>

> Jon,

> Can you provide a copy of the proposed plan for lcp when it is available.

> Thanks
> Carrie
>
> Sent from my iPhone

Superfund Program United States Environmental Protection Agency, Region 2 Proposed Plan

LCP Chemicals Inc. Superfund Site August 2013

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the preferred alternative for addressing the contamination at the LCP Chemicals Inc. Superfund Site (Site). The Site is comprised of groundwater, soil, sediments and buildings materials that contain elevated levels of Site related contaminants including mercury.

The United States Environmental Protection Agency's (EPA) Preferred Alternative is Alternative 4b; full containment of contaminated soils and sediments; full stabilization of principal threat wastes; capture and treatment/disposal of overburden groundwater; partial restoration of South Branch Creek; and demolition of Site buildings. A key element of the remedy will be institutional controls and groundwater monitoring. The remedy is the final remedy for the Site and addresses the following contaminated media: soils, soil vapor, sediments and groundwater.

EPA is issuing this Proposed Plan as part of its community relations program under Section 117(a) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, or Superfund) 42 U.S.C. 9617(a). This Proposed Plan summarizes information that can be found in greater detail in the remedial investigation and feasibility study (RI/FS) reports and other documents contained in the Administrative Record for this Site. EPA and the New Jersey Department of Environmental Protection (NJDEP) encourage the public to review these documents to gain a more comprehensive understanding of the Site and Superfund activities that have been conducted.

This Proposed Plan includes summaries of the cleanup alternatives evaluated for use at the Site. This document is issued by EPA, the lead agency for Site activities, and NJDEP, the support agency. EPA, in consultation with NJDEP, will select the final remedy for the Site after reviewing and considering all information submitted during a 30-day public comment period. EPA, in consultation with NJDEP, may modify the preferred alternative or select another response action presented in this Proposed Plan based on new information or public comments. EPA relies on public input to ensure that the concerns of the community are considered in selecting

the remedy for each Superfund site. Therefore, the public is encouraged to review and comment on all of the alternatives presented in this document.

SITE DESCRIPTION

The Site is located in an industrial area on the Tremley Point peninsula in Linden, Union County, NJ. The twenty-six acre Site is bordered by the Arthur Kill to the east; the former General Aniline & Film (GAF) Corporation site to the north; and facilities owned by Northville Industries, BP Corporation and Mobil to the northeast, south and west respectively. South Branch Creek, a manmade drainage ditch that empties into the Arthur Kill, flows through a portion of the Site (Figure 1).

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:

August 21, 2013 – September 20, 2013

EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: August 28, 2013

EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the feasibility study. Oral and written comments will also be accepted at the meeting. The meeting will be 7:00pm at the

**Tremley Point Recreation Building
2907 Tremley Point Road
Linden, NJ 07036**

For more information, see the Administrative Record at the following locations:

U.S. EPA Records Center, Region II
290 Broadway, 18th Floor.
New York, New York 10007-1866
(212) 637-4308

Hours: Monday-Friday - 9 am to 5 p.m., by appointment.

Linden Public Library
31 East Henry Street
Linden, NJ 07036

SITE HISTORY

Beginning in the 1880s and into the 1950s, Tremley Point's tidal wetlands were filled to allow for industrial development. The LCP Chemicals Inc. property was

originally a portion of a larger industrial complex with chemical manufacturing operations. In 1955, GAF Corporation constructed and began operating a chlor-alkali (chlorine manufacturing) plant on the Site. In 1972, the LCP Property and the chlor-alkali operation were purchased by LCP Chemicals, Inc., a division of the Hanlin Group Inc. Soon after the purchase, an additional mercury cell building (building 240) and other buildings were added by LCP Chemicals.

The chlor-alkali manufacturing operation ceased by 1985, after which the facility was used as a terminal for products produced at other locations. In 1991, Hanlin Group, Inc. filed a petition under Chapter 11 of the bankruptcy code and liquidated its assets by 1994.

In August 1994, EPA conducted a Site visit and confirmed that the chlorine process buildings were decommissioned, the facility was no longer functional and that the property was vacated by LCP employees.

The Property has remained abandoned since the early 1990s. The buildings, in particular the mercury cell buildings, are in an advanced state of disrepair.

The Site was placed on the National Priorities List (NPL) on July 28, 1998. In May 1999, ISP Environmental Services, Inc. entered into an Administrative Order with EPA to perform the RI/FS for the Site.

SITE CHARACTERISTICS

The RI field investigation was performed at the Site in two major phases between July 2001 and May 2008. The Phase I field investigation was conducted between July 2001 and April 2002. It included the collection and analysis of samples from soil, groundwater, surface water and sediments at locations throughout the Site. Data were also collected to provide a geologic, hydrologic and hydrogeologic interpretation of the Site.

The Phase II field investigation was performed at the Site from August 2006 to June 2007. Additional samples were collected in May 2008. The Phase II investigation included samples from soil, soil vapor, groundwater, surface water, sediment and biota. Other work included hydrogeologic testing, habitat assessment and a wetlands assessment.

Soil:

The entire upland area is covered with about 300,000 cubic yards of anthropogenic fill, which ranges in thickness from approximately 0.7 feet to as much as 17 feet with an average thickness of roughly nine feet. The fill consists of a heterogeneous mix of soil, ash, wood, brick and glass. Below the fill is a layer of tidal marsh

deposits ranging in thickness from five to ten feet. Peat (i.e., loose, soft fibrous material) comprises the upper portion of the tidal marsh deposits and grades to organic silt and clay. Underlying the tidal marsh deposits is a layer of fine-grained glacial till comprised primarily of silts and clays. The glacial till ranges in thickness from 18.5 feet to 20.5 feet. Finally, below the glacial till is bedrock of the Passaic Formation. The upper portion of the bedrock is highly weathered residual soil composed of fine-grained silts and clays with shale fragments, similar to the overlying glacial till. The layer transitions to competent bedrock with depth.

The soils are contaminated with constituents including mercury, arsenic and other metals, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), as well as volatile organic chemicals (VOCs) at levels above the New Jersey non-residential soil standards. The Region considers mercury to be the primary contaminant of concern, due to its persistence, toxicity and overall mass at the Site. Mercury is typically in the elemental or mercuric sulfide form and at the highest levels (>7,000 milligrams/kilogram (mg/kg)) in the anthropogenic fill. In areas near the chlor-alkali cell buildings, free elemental mercury is present down to a depth of about 17 feet. EPA considers the soil with visible mercury (about 24,000 cubic yards) to be the Site's principal threat waste (PTW).

WHAT IS A "PRINCIPAL THREAT"?

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

South Branch Creek/Northern Off-Site Ditch:

South Branch Creek is a man-made drainage ditch originating in the central portion of the Site and flowing east for about 1,200 feet before emptying into the Arthur Kill. The Arthur Kill is a ten mile long tidal straight, with multiple industrial contaminant sources, that connects Raritan Bay with Newark Bay (Figure 2). The upstream portion of the South Branch Creek is about 15 feet wide expanding to about 30 feet wide where it enters the Kill. It has roughly a five foot tidal range, and becomes dry over most of its course during low tides. The Creek banks

contain a relatively narrow strip of low marsh soils classified by the New Jersey Department of Environmental Protection (NJDEP) as “intermediate value” wetlands.

Exceedances of state surface water standards were detected for a number of substances in the South Branch Creek, including mercury and arsenic. Mercury was not detected in filtered samples, however the concentrations in unfiltered samples ranged from 3.2 parts per billion (ppb) to 5.8 ppb. This seems to indicate that Site-related mercury is being suspended on sediments into the South Branch Creek water column due to tidal stream velocities. Low marsh soils adjacent to the Creek contained high levels of mercury (maximum concentration of 3,000 mg/kg). Mercury was also detected in all fish and fiddler crab tissue analyzed, with a mean total mercury concentration of 2.6 mg/kg and 70 mg/kg in fish and fiddler crabs tissue, respectively.

Sediment samples were collected from the South Branch Creek and adjacent to the Creek’s mouth in the Arthur Kill. Mercury, arsenic, barium and total PCBs were the most frequently detected contaminants of concern (COCs) in the South Branch Creek sediments. Mean concentration of mercury in the sediments was 196 mg/kg, with a high concentration of 901 mg/kg. Similar to the findings in soils, mercury speciation showed the most common type of mercury was elemental and mercuric sulfide.

The Northern Off-Site Ditch is a man made ditch located south of the LCP property that empties into the South Branch Creek. Three transects of sediment samples were collected from the Northern Off-Site Ditch, the results of which indicate that the Ditch was impacted by overland flow from the LCP Site.

Groundwater:

Groundwater at the Site is found in two layers separated by an aquitard consisting of silt and clay. The shallower layer (overburden zone) is within the fill and the peat subunit of the tidal marsh deposits. The deeper layer (bedrock zone) is within the upper portion of the bedrock.

Samples of the overburden groundwater showed exceedances of the applicable state groundwater standards for several constituents, including mercury, arsenic and VOCs. Dissolved mercury concentrations ranged from non-detect (ND) to 164 ppb. Concentrations of other constituents, such as chlorobenzene (from ND to 16,200 ppb), benzene (ND to 848 ppb) and arsenic (up to 275 ppb), showed high levels of exceedances. The overburden groundwater is classified as Class II-A, meaning existing New Jersey Groundwater Quality Standards (NJGWQS) are applicable. However, due to

the shallow depth and low production potential of the zone, it could not be used as a source of potable water in NJ.

The bedrock zone has been reclassified by the state to Class III-B groundwater, meaning it cannot be used as a source of potable water. Class III-B groundwater requires the development of site specific criteria. Those criteria have not yet been developed, so currently the bedrock zone has no applicable standards. While site specific groundwater criteria are being developed, the NJDEP has suggested using state surface water standards as the bedrock zone’s standards. Sample results show that mercury and other constituents exceed surface water standards in the bedrock zone. High concentrations of mercury, benzene and chlorobenzene were 11 ppb, 383 ppb and 14 ppb, respectively. Potentiometric studies indicate that the groundwater in the bedrock zone underlying the Site is currently being controlled by a pump and treat remedy at the adjacent GAF Corporation site.

Building Debris:

Various buildings and structures remain on the LCP property. The buildings are in a state of disrepair and in the case of the former mercury cell buildings, unsafe to enter. Anecdotal evidence suggests that the buildings’ porous material contains free elemental mercury. The amount of building material on Site is roughly 32,000 cubic yards (61,000 tons).

SCOPE AND ROLE OF THE ACTION

The long-term cleanup will be conducted in one phase, or Operable Unit (OU1), which is the subject of this Proposed Plan. The selected remedy will address the contaminated groundwater, sediments, soils, soil vapor and building debris.

SUMMARY OF SITE RISKS

As part of the RI and FS, a baseline risk assessment was conducted to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases, under current and future land and groundwater uses. Once remedied, the LCP property will be used for commercial/industrial purposes.

Human Health (HHRA) and Baseline Ecological (BERA) risk assessments were completed as part of the RI.

HHRA

The cancer risk and noncancer health hazard estimates in

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current and future land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the contaminants of concern at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil. Factors relating to the exposure assessment include, but are not limited to, the concentrations that people might be exposed to and the potential frequency and duration of exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure (dose) and severity of adverse effects (response) are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health effects, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and noncancer health effects.

Risk Characterization: This step summarizes and combines exposure information and toxicity assessments to provide a quantitative assessment of site risks. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions explained in the Exposure Assessment. Current Superfund guidelines for acceptable exposures are an individual lifetime excess cancer risk in the range of 10^{-4} to 10^{-6} (corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk). For noncancer health effects, a "hazard index" (HI) is calculated. An HI represents the sum of the individual exposure levels compared to their corresponding reference doses. The key concept for a noncancer HI is that a "threshold level" (measured as an HI of less than 1) exists below which noncancer health effects are not expected to occur.

the HHRA are based on potential future exposure scenarios and were developed by taking into account various estimates on the frequency and duration of an individual's exposure to chemicals of potential concern (COPCs), as well as the toxicity of these contaminants. Cancer risks and noncancer health hazard indexes (HIs) are summarized below (please see the text box on the following page for an explanation of risk assessment terms).

Human exposures to Site media are currently limited since the Site is unoccupied and not used for operational purposes. The Site is surrounded by perimeter fences and locked gates. Groundwater is not being used for any purpose.

The habitat within the South Branch Creek is generally unsuitable for fish species that are used for human consumption. In addition, the industrial setting and substantial barriers to access (i.e., small boat via the Arthur Kill and only during high tide), means trespassers would be unlikely to catch and/or consume fish/shellfish from South Branch Creek. Therefore the fish/shellfish consumption pathway for South Branch Creek is considered incomplete and was not evaluated in the HHRA.

As described below, the human health risks were assessed for four current and/or potential future receptors exposed to site soils and two receptors also exposed to overburden groundwater.

Current/Future Trespassers

Based on exposure to Site sediments and soils, data indicate there would not be an unacceptable cancer risk for this receptor as the cumulative cancer risks are within the EPA's acceptable risk range, as defined in the text box on this page. However, there would be a limited unacceptable cumulative noncancer health hazard as the cumulative noncancer HI for the Reasonable Maximum Exposure (RME) is slightly greater than the benchmark value of 1 (1.4). The average or Central Tendency Exposure (CTE) resulted in an HI below 1.

Future Commercial/Industrial Workers

Data indicate there would be an unacceptable cancer risk for this receptor from exposure to soils, and groundwater. The RME and CTE cancer risks for soil and groundwater were not within EPA's acceptable risk range at 5.1×10^{-3} and 1.6×10^{-3} , respectively. The cumulative noncancer HI for the RME (190) and CTE (170) were also unacceptable as they were greater than 1.

A vapor intrusion model was used to separately evaluate the potential cancer and noncancer risks from exposure to contaminants in soil vapor at the

Site. The model indicated that there would be an additional noncancer hazard (HI = 4.8) to a commercial/industrial worker population exposed to vapors inside buildings.

Future Site-Specific Workers

A Site-Specific Worker is a commercial or industrial worker who is on the property with less frequency, such as a truck driver.

Based on exposure to Site soils, data indicate that cumulative cancer risks are within the acceptable risk range for this receptor; however, the cumulative noncancer health hazard is unacceptable and greater than the benchmark value of 1 (RME = 4.5 and CTE = 1.5).

Future Construction/Utility Worker

Based on exposure to Site soils and groundwater, data indicate that cumulative cancer risks are within the acceptable risk range for this receptor; however, the noncancer health hazard is above the benchmark value of 1 (RME = 78 and CTE = 39).

Conclusions Potential noncancer human health hazards in soil and soil vapor are driven by mercury, while potential cancer risks in soil are from arsenic, PCBs, furans, carcinogenic PAHs, and hexachlorobenzene. For groundwater, the noncancer health hazards are largely from furans and manganese, while cancer risk in groundwater was primarily from arsenic and benzene. In addition, soil and groundwater concentrations for these and other contaminants exceeded applicable NJGWQS.

It was not scientifically possible to quantify concentrations in areas with visible mercury, so soil with visible mercury was not included in the risk determination. If it were included, the noncancer risks would be substantially higher.

Screening Level Ecological Risk Assessment/BERA

As part of the RI/FS, a Screening Level Ecological Risk Assessment (SLERA) was conducted to identify potential environmental risks associated with a site. The SLERA indicated there was a potential for adverse ecological effects. Therefore a more thorough study, called a Baseline Ecological Risk Assessment (BERA), was performed.

Some ecological exposure pathways were determined to be complete. Exposure was assumed to occur via ingestion of contaminated prey and ingestion of substrate, including incidental ingestion during feeding and grooming.

While the principal ecological concerns are for benthic macroinvertebrates in South Branch Creek sediments, elevated risk to upper-trophic level receptors (e.g., great blue heron) exposure to South Branch Creek sediments also exist. An elevated risk to fish-eating birds is also present. In addition, upland soils could pose a risk to mammalian insectivores, and areas of visible mercury are assumed to be an ecological risk to terrestrial wildlife receptors.

Summary

It is the EPA's judgment that the preferred alternative identified in this Proposed Plan is necessary to protect public health and the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

The following remedial action objectives address the human health risks and environmental concerns posed by contamination at the Site:

- Reduce or eliminate potential current and future unacceptable risks to human and ecological receptors resulting from ingestion and dermal contact with soils and groundwater.
- Reduce or eliminate potential current and future unacceptable risks to human receptors resulting from inhalation of mercury vapors emanating from soils and marsh deposits.
- Reduce or minimize migration of soil contamination to groundwater or surface water.
- Prevent or minimize migration of contaminated groundwater, and, to the extent practicable, remediate to applicable standards outside the waste management area.
- Reduce or eliminate unacceptable risks to human and ecological health as a result of ingestion or dermal contact with Site sediments.
- Reduce or eliminate human exposure to contaminated building materials that may result in unacceptable risk.

To achieve RAOs, EPA set cleanup goals for the Site's soil, sediments, and groundwater. The cleanup goals for soil, including for mercury (65 parts per million) and other COCs, is based on the NJ Soil Remediation Standard for

direct contact to non-residential soils. The PTW is soils containing visible mercury.

Since the sediments will be recontaminated by the Arthur Kill, the cleanup goals for the South Branch Creek and Northern Off-Site Ditch sediments will be set at levels consistent with those found in the Arthur Kill and/or nearby tributaries sediments. For groundwater, the cleanup goal for the overburden zone is the New Jersey Groundwater Quality Standard for Class IIA groundwater. The bedrock zone has been classified Class IIIB, which require the development of state approved site specific criteria. Until the site specific criteria are developed, the cleanup goals for COCs in the bedrock zone will be the New Jersey Surface Water Standards for saline waters.

Aside from the marginal risk to a trespasser, currently there are no complete pathways for unacceptable human health risks from the Site. There are, however, current complete pathways for ecological receptors. Therefore the remedial actions are necessary to protect human health and the environment from the site contaminants.

SUMMARY OF REMEDIAL ALTERNATIVES

Potential applicable technologies were identified and screened using effectiveness, implementability and cost as the criteria, with the most emphasis on the effectiveness of the remedial action. Those technologies that passed the initial screening were then assembled into five remedial alternatives.

Except for the No Action Alternative (Alternative 1), each remedial alternative would be coupled with institutional controls to limit the potential exposure to Site contamination. Institutional controls are typically restrictions placed to minimize human exposure. Institutional controls are generally used in conjunction with other remedial technologies. Consistent with expectations set out in the Superfund regulations, none of the action alternatives rely exclusively on institutional controls to achieve protectiveness.

The time frames below for construction do not include the time for designing the remedy or the time to procure necessary contracts. Because all the alternatives result in contamination remaining on the Site above levels that would not allow for unlimited use and unlimited exposure, a review will be conducted every five years (five-year reviews).

Alternative 1 - No Action

The No Action alternative was retained for comparison purposes as required by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the

regulation under which EPA implements the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). No remedial actions would be implemented as part of the No Action alternative. This alternative does not include institutional controls.

Total Capital Cost	\$0
Operation and Maintenance	\$0
Total Present Net Worth	\$0
Timeframe	0 years

Alternative 2 – Partial Containment (Treatment Cap)

For the contaminated soil, a capping system would be installed to both prevent direct contact with soils on a Site-wide basis and to interrupt the potential for inhalation exposure to mercury vapor. The area under the cap, including the overburden layer of groundwater, will be considered a waste management unit. The cap would incorporate a soil layer, and a three-inch thick “treatment layer” of sulfur placed under an impermeable geosynthetic membrane. The geosynthetic membrane would serve to prevent vaporization of mercury (and other contaminants) as well as prevent rainwater infiltration into the underlying groundwater.

Since the sediments will likely get recontaminated by the Arthur Kill, source reduction will be the focus of the sediment remedy. The cleanup level for the South Branch Creek and Northern Off-Site Ditch sediments will be set at levels consistent with levels found in the Arthur Kill and/or nearby tributaries.

Sediments with unacceptable levels of contaminants in the downstream portion of the South Branch Creek as well as in the Northern Off-Site Ditch would be excavated and placed in the upstream portion of the South Branch Creek. The upstream portion would be then placed under the cap. The downstream portion and the Northern Off-Site Ditch would be restored with clean sediment, and the adjacent wetlands reconstructed. In addition, wetlands mitigation will be implemented at another location for the area that has been lost under the cap.

The buildings on Site would be demolished in a controlled manner. Steel and other non-porous material would be segregated, decontaminated and recycled. Porous material that has visible signs of contamination will be vacuumed and treated with sulfur. The debris will be processed to reduce its size then placed under the cap.

Alternative 2 will include collection of groundwater from the overburden aquifer layer A shallow system would be installed along the limits of the cap. The collected groundwater would be either piped to the adjacent GAF site for treatment, or sent to the local publicly owned treatment works for appropriate treatment and disposal. Groundwater monitoring would be performed in the

overburden aquifer to confirm that there is an inward gradient to the Site, and in the bedrock aquifer to confirm that the deeper groundwater is not being impacted by the LCP Site.

This remedy would require air monitoring during building demolition and work where the soil or sediments are disturbed. In addition, this remedy will include institutional controls (e.g., an NJDEP Classification Exception Area (CEA) and a deed notice) to prevent exposure to contaminated groundwater and to restrict the property to industrial or commercial use. A long-term monitoring program will be developed to ensure the continued protectiveness of the remedy, and also to assess potential migration and natural degradation of the contaminated groundwater.

Total Capital Cost	\$19.9 million
Operation and Maintenance	\$ 1.1 million (30 yrs)
Total Present Net Worth	\$21.0 Timeframe
	30 years

Alternative 3 Full Containment (Treatment Cap and Barrier Wall)

The Alternative 3 remedy for soils is the same as Alternative 2, except it includes a barrier wall, such as sheet piling, to further limit the potential for lateral migration of contaminants off-site. The low permeability barrier wall would be installed along the limits of the soil cap and tied into the top of the glacial till layer (~15 feet below ground surface (bgs)).

Like Alternative 2, Alternative 3 will include collection of groundwater from the overburden aquifer layer. However, for Alternative 3, the shallow collection system would be installed along the interior limits of the barrier wall. The system would likely consist of a collection pipe with pump stations as needed. Groundwater monitoring would be performed as described in Alternative 2.

Alternative 3 includes the same remedial components for sediments and building materials as Alternative 2, including institutional controls and long-term monitoring.

Total Capital Cost	\$23.8 million
Operation and Maintenance	\$ 1.1 million (30 yr)
Total Present Net Worth	\$24.9 million
Timeframe	30 years

Alternative 4a and 4b – Full Containment and Partial/Full Depth PTW Stabilization

Alternative 4a and 4b contains all the components of Alternative 3. Alternative 4a and 4b also includes treatment of the PTW soils through stabilization. The stabilization treatment's primary goal would be to convert the elemental mercury to mercuric sulfide. Mercuric sulfide (i.e., cinnabar) is insoluble, does not generate vapors and is a solid at ambient temperatures. Two approaches were analyzed for this alternative, Alternative 4b is treatment to the full depth of the PTW area (up to 17 feet bgs) and Alternative 4a includes treatment of only the shallower soils (up to 6 feet bgs). The shallower soils contain the majority (>80%) of the elemental mercury.

Alternative 4a

Total Capital Cost	\$33.2 million
Operation and Maintenance	\$ 1.1 million (30 yr)
Total Present Net Worth	\$34.3 million
Timeframe	30 years

Alternative 4b

Total Capital Cost	\$35.2 million
Operation and Maintenance	\$ 1.1 million (30 yr)
Total Present Net Worth	\$36.3 million
Timeframe	30 years

Alternative 5 – Full Containment and Partial/Full Depth PTW Excavation Off-Site Disposal

Alternative 5 (i.e., 5a and 5b) contains all the components of Alternative 3. Alternative 5 also includes removal and off-site disposal of the PTW, and some of the contaminated building debris. PTW soil and building debris would be disposed of at the US Ecology/Stablex Facility in Canada. Post excavation sampling would be performed. Similar to Alternative 4, two approaches were considered, removal to the full depth of the PTW area (up to 17 feet bgs) and removal of only the shallower (up to 6 feet bgs) soils.

Alternative 5a

Total Capital Cost	\$84.2 million
Operation and Maintenance	\$ 1.1 million (30 yr)
Total Present Net Worth	\$85.3 million
Timeframe	30 years

Alternative 5b

Total Capital Cost	\$96.2 million
Operation and Maintenance	\$ 1.1 million (30 yr)
Total Present Net Worth	\$97.3 million
Timeframe	30 years

Evaluation of Remedial Alternatives

The alternatives were evaluated according to the following criteria:

Overall Protection of Human Health and the Environment

Alternative 1 would not provide protection of human health, since uncontained contamination would persist in the soils, sediments, groundwater and building material. Potential and existing routes of exposure to humans and animals would be unrestricted. Also, there would be no mechanism to monitor the migration of the contamination.

Alternatives 2 through 5 would provide protection of human health and the environment by preventing exposure to contaminated media through installation of an impermeable cap. Alternatives 2 through 5 would also provide protection of human health through implementation of institutional controls to interrupt potential future exposure. The barrier wall would further limit the potential for lateral migration of contamination within the Site soils (e.g., vapor) and groundwater. Therefore Alternative 2 would be less protective than the other action alternatives as it does not include a barrier wall.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

Concentrations of contaminants exist at levels above the applicable groundwater and soil standards (e.g., the New Jersey Groundwater Quality Standards and the New

Jersey Soil Remediation Standards). Except for Alternative 1, all alternatives would address the contaminated soil through containment and address the overburden groundwater through capture, containment and treatment.

THE NINE SUPERFUND EVALUATION CRITERIA

1. Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

3. Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

4. Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

5. Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

6. Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

7. Cost includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

8. State/Support Agency Acceptance considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

9. Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

All alternatives except Alternative 1, would comply with location and action-specific ARARs.

Long-Term Effectiveness and Permanence

Alternative 1 would not be effective or permanent, since the contaminants would not be monitored and there would be no mechanism to prevent future exposure. In general,

the relative degrees of effectiveness and permanence associated with Alternatives 2, 3, 4a and 4b, and 5a and 5b are comparable; however Alternatives 4a and 4b would provide an additional component of protection by further reducing the potential mercury vapor pathway through the conversion of the PTW elemental mercury to mercuric sulfide. EPA expects that conversion will be permanent. Similarly, Alternatives 5a and 5b would provide additional protection over Alternatives 2 and 3 by removing the area of PTW.

The effectiveness of the action alternatives would be assessed through periodic groundwater monitoring and five-year reviews.

Reduction of Toxicity, Mobility or Volume Through Treatment

Alternative 1 would not reduce the toxicity, mobility and volume (TMV) through treatment as no active treatment occurs. All the action alternatives will reduce the mobility of the contamination through containment, as well as potentially reducing some of the toxicity and mobility through conversion of elemental mercury at the cap's "treatment layer." Alternatives 3, 4a and 4b and 5a and 5b afford additional reduction of mobility through the use of a barrier wall.

Alternatives 4a and 4b would best meet this criterion by reducing the toxicity and mobility of the mercury through conversion of the visible elemental mercury to mercuric sulfide. Mercuric sulfide is less toxic, less soluble and less volatile than elemental mercury.

Alternatives 5a and 5b would reduce the mobility, but not toxicity and volume of elemental mercury at the Site through removal and disposal rather than treatment.

Short-Term Effectiveness

For Alternative 1, protection of the community and workers during remedial activities would not be applicable as no remedial action is occurring.

Alternatives 2, 3 and 5a and 5b would have roughly the same construction period of about two to three years. Alternative 4a and 4b would have the longest construction period (three to four years) due to the time required to perform in-situ mixing, as well as to perform the necessary pilot studies.

All the action Alternatives will result in an increase in short term mercury vapor emissions over baseline conditions. Alternative 5a and 5b would have the largest increase in emissions during the implementation (101 to 197 pounds). In addition, Alternative 5a and 5b would require between 1,000 and 2,000 trucks to first remove the PTW soil and debris, then to bring in substrate to backfill the excavated areas. Thus Alternative 5a and

5b is the only option that would significantly increase the truck traffic through the local community.

Alternative 4a and 4b would have the smallest increase in mercury vapor emissions (0.5 to 0.8 pounds) because of the widespread use of a sulfur compounds. Alternatives 2 and 3 would have an increase of an estimated 7.7 pounds.

Health and Safety Plans, which would include air monitoring, engineering controls and appropriate worker personal protective equipment (PPE), would be used to protect the community and workers for Alternatives 2 through 5.

Implementability

All the action alternatives are implementable with conventional materials and equipment. Alternatives 2 and 3 would be the easiest to implement.

Alternative 4a and 4b would require specialized equipment to mix the soil, as well as methods to address subsurface obstructions. Alternative 4b would be more difficult to implement due to the greater depth and the associated subsurface obstacles.

Alternative 5a and 5b would require disposal of elemental mercury wastes outside the United States to a single facility in Canada. Some uncertainty still exists on whether the facility can handle the mass from this Site. In addition, due to the Mercury Export Ban regulations, if the mercury is retorted, the recovered elemental mercury would have to be sent back to the United States for either sale or long-term storage.

Cost

Each action alternative includes long term operation and maintenance. Therefore a seven percent discount rate was used to derive each alternative's present net worth cost.

Alternative 1 incurs no cost but provides no protection to human health. Except for Alternative 1, Alternative 2 is the least expensive of the alternatives. Alternatives 5a and 5b are the most expensive alternatives. Alternative 4a and 4b are relatively close in price to Alternatives 2 and 3. However, costs for Alternative 4a and 4 b could be substantially higher than estimated depending on the results of the pilot study.

State/Support Agency Acceptance

The State of New Jersey concurs with EPA's preferred alternative for this Site as described in this proposed plan.

Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period ends and will be described in Responsiveness Summary in the Record of Decision for this site. The Record of Decision is the

document that formalizes the selection of the remedy for a site.

SUMMARY OF THE PREFERRED ALTERNATIVE

The preferred alternative for the LCP Chemicals Inc. Superfund Site is Alternative 4b, Treatment Cap/Barrier Wall with Full Depth Stabilization.

A capping system will be installed to both prevent direct contact with soils on a Site-wide basis and to interrupt the potential for inhalation exposure to mercury vapor. The cap would incorporate a soil layer, and a three-inch thick “treatment layer” of sulfur placed under an impermeable geosynthetic membrane. The “treatment layer” will be used only over areas of mercury contaminated soil that were not otherwise treated.

The geosynthetic membrane would serve to prevent vaporization of mercury (and other contaminants) as well as prevent rainwater infiltration into the underlying groundwater. A low permeability barrier wall would be installed along the limits of the soil cap and tied into the top of the glacial till layer (~15 foot depth). Areas with PTW will be treated by mixing the soil with sulfur to convert the elemental mercury to mercuric sulfide. A pilot study, with clearly defined treatment goals, will be performed prior to full implementation of the remedy.

Sediments with unacceptable levels of contamination in the Northern Off-Site Ditch and in the downstream portion of the South Branch Creek would be excavated and placed under the cap. The excavated sediment areas and the adjacent wetlands would be reconstructed. In addition, wetlands mitigation will be implemented at another location for the area that has been lost. During the design phase, EPA will determine a cleanup level that is consistent with existing levels in the Arthur Kill or nearby tributaries.

The buildings on Site would be demolished in a controlled manner. Steel and other non-porous material would be segregated, decontaminated and recycled. Porous material that has visible signs of mercury contamination will be vacuumed and treated with sulfur. The debris will be processed to reduce its size then placed under the cap. Air monitoring would be required during building demolitions, and also during other activities where the soil or sediments are disturbed.

Aside from the containment afforded by the barrier wall, the proposed remedy will include collection of groundwater from the overburden layer. A shallow system would be installed along the interior limits of the barrier wall. The system would likely consist of a shallow collection pipe with pump stations as needed.

The collected groundwater would be either piped to an adjacent site for treatment, or sent to the local POTW. Groundwater monitoring of the overburden aquifer would be performed to ensure that there is an inward gradient to the Site. After the cap is installed, EPA expects the overburden area under the cap to dry out in less than 10 years. Groundwater monitoring of the bedrock aquifer will be performed to ensure that it is not being impacted by the capped Site.

While the financial costs of the preferred alternative are relatively high, the costs are due to the many components and complex nature of this single operable unit. The cost of this alternative was significantly lower than the removal alternative, so it is the less expensive of the two alternatives that specifically address the PTW.

The preferred alternative would prevent human and ecological exposure to Site contaminants in the soil, sediments, groundwater and building material. In addition, the preferred alternative’s cap design would allow for future commercial use of the property. As contamination above acceptable risk levels will remain on the Site, five-year reviews will be performed.

The preferred alternative was selected over other alternatives principally because it is expected to achieve substantial and long-term risk reduction through treatment of the PTW as well as containment.

Based on information currently available, EPA believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing and modifying criteria. EPA expects the preferred alternative will satisfy the following statutory requirements of CERCLA Section 121(b): (1) be protective of human health and the environment; (2) comply with ARARs; (3) be cost-effective; (4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and (5) satisfy the preference for treatment as a principal element.

Consistent with EPA Region 2’s Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to implementation of the selected remedy.

EPA recognizes that the preferred alternative includes a treatment approach for PTW that is innovative; therefore EPA is also proposing two contingency remedies in case the preferred remedy is unworkable.

CONTINGENCY REMEDIES

If, after reviewing the pilot study results, EPA determines that treating the PTW to full depth is not technically practicable, EPA will use the first contingency remedy.

The first contingency would be Alternative 4a, treatment of the PTW to mid-depth. If EPA determines that the treatment of the PTW waste is not meeting pre-set goals at any depth, then EPA will use the second contingency remedy, Alternative 3. Alternative 3 is the same as the preferred alternative, except without treatment of the PTW.

If EPA chooses to implement one of the contingency remedies, EPA will issue a decision document (such as an Explanation of Significant Differences) to record this change in the remedial approach.

COMMUNITY PARTICIPATION

EPA provided information regarding the cleanup of the LCP Chemical Inc. Superfund Site to the public through the Administrative Record file for the site and announcements published in the local newspaper. EPA encourages the public to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted there.

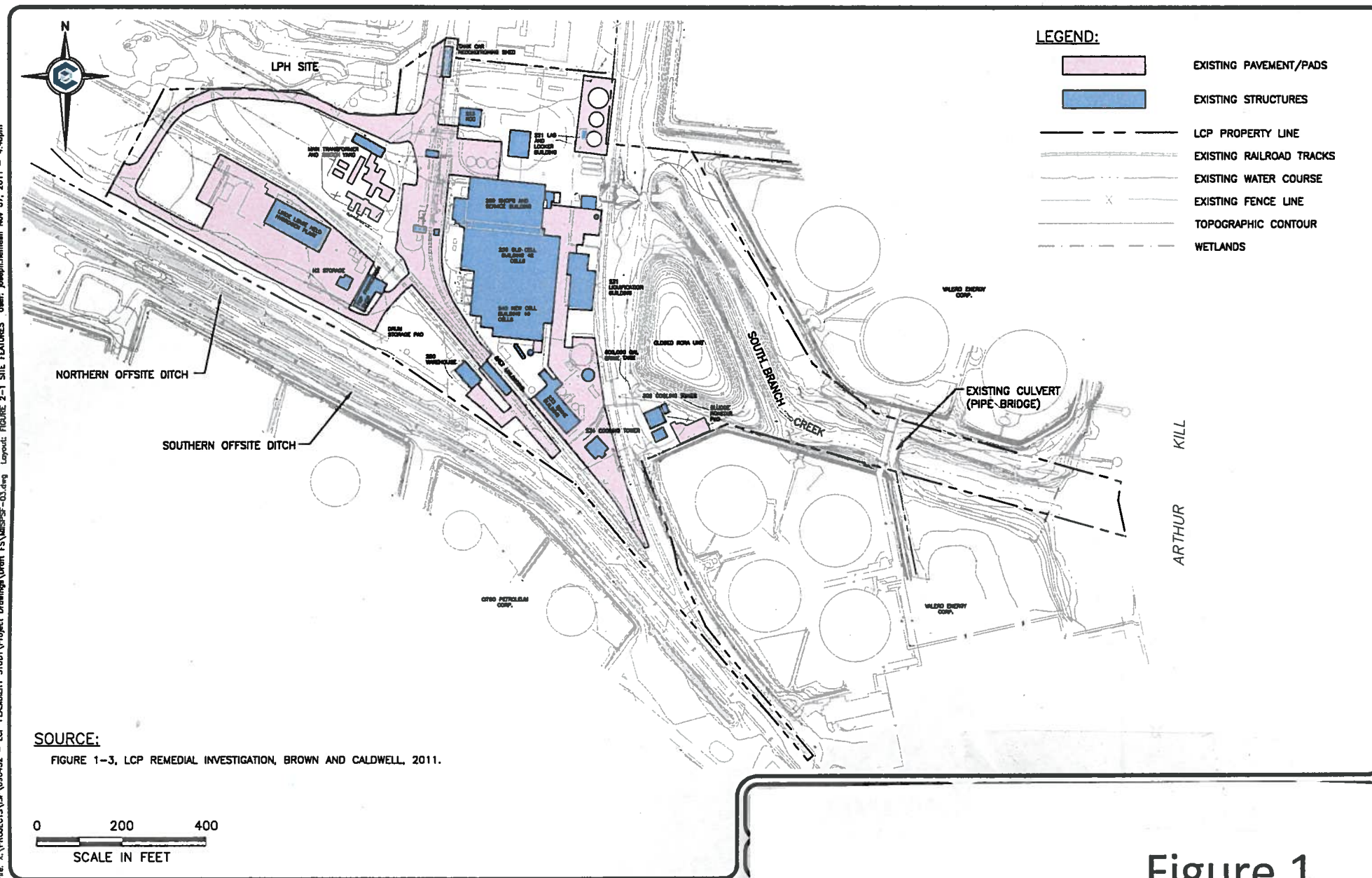
For further information on EPA's preferred alternative for the LCP Chemical Inc. Superfund Site:

Jon Gorin	Natalie Loney
Remedial Project Manager	Community Relations
(212) 637-4361	(212) 637-3639

U.S. EPA
290 Broadway 19th Floor
New York, New York 10007-1866

The RI/FS reports can also be found on line at:
www.epa.gov/region2/superfund/npl/lcp/

The dates for the public comment period; the date, the location and time of the public meeting; and the locations of the Administrative Record file are provided on the front page of this Proposed Plan.



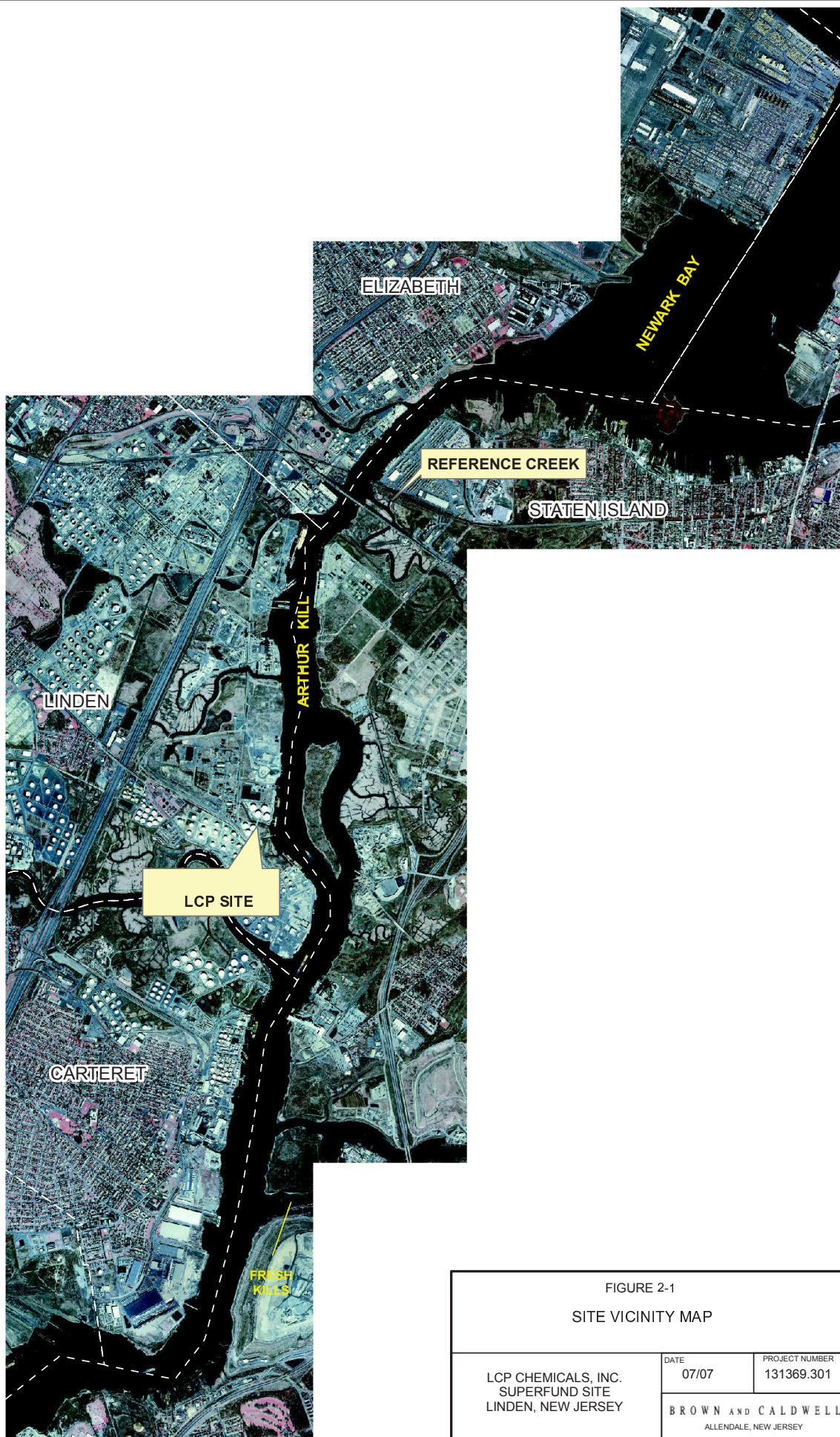


FIGURE 2-1
SITE VICINITY MAP

LCP CHEMICALS, INC.
SUPERFUND SITE
LINDEN, NEW JERSEY

DATE
07/07

PROJECT NUMBER
131369.301

BROWN AND CALDWELL
ALLENDALE, NEW JERSEY